

**REMARKS/ARGUMENTS**

In the Office Action mailed June 28, 2007, claims 1-33 were rejected. Applicants have thoroughly reviewed the outstanding Office Action including the Examiner's remarks and the references cited therein. The following remarks are believed to be fully responsive to the Office Action. All the pending claims at issue are believed to be patentable over the cited references.

Claims 2-6, 8, 9, and 11-33 have been amended. Claims 3 and 20 are amended to remove reference to the "FR4" trademark and are broadening amendments. Claims 2, 4-6, 8, 9, 11-19, and 21-33 have been amended to correct clerical errors. Applicants note that the Examiner has numbered the new claims added in the Preliminary Amendment of April 20, 2005 as claims 28-33. Accordingly, the Applicant has amended claims 30 and 32 to match the contextual dependency to the re-ordering of the claims. These amendments are not made for reasons of patentability. No claims have been added. As such, claims 1-33 remain pending.

**CLAIM REJECTIONS – 35 U.S.C. § 102(e)**

The Examiner rejected claims 1-12, 18-21, and 28-33 under 35 U.S.C. § 102(e) as being anticipated over United States Patent No. 6,949,771 to Yoganandan *et al.* (hereinafter referred to as "Yoganandan"). In light of the following remarks, Applicants respectfully submit that these claims are allowable.

Initially, Applicants note that it is axiomatic that to qualify as an anticipation under Section 102, the cited reference must "bear within its four corners adequate directions for the practice of the patent invalidated." (See, for example, *Dewey & Almay Chemical Co. v. Mimex Co., Inc.*, 52 U.S.P.Q. 138 (2<sup>nd</sup> Cir. 1942)). The Examiner asserts that regarding claims 1-12

and 28-33, Yoganandan discloses "a light source having a plurality of light sources 230, a plurality of cavities 220, a substrate 2310, insulated body, a FR4 substrate..., a pad 270 below the substrate made of copper, a plurality of conductors for drive circuit 240, 242 and a plurality of layers 250, and 252." See Office Action, page 2, paragraph 5. The Applicants hereby assert that these elements are not found in the claims pending in the instant application.

Independent claim 1 discloses "an illuminator comprising an array of a plurality of light sources mounted in a plurality of cavities in a substrate, and an electrical drive circuit, wherein the substrate comprises an electrically insulating body plated with plural conductors for the drive circuit." (Emphasis added). Independent claim 7 discloses "an illuminator comprising an array of a plurality of light sources mounted in a plurality of cavities in a substrate, an electrical drive circuit, wherein the substrate comprises an electrically insulating body plated with plural conductors for the drive circuit, and a thermally conductive structure under the plural light sources. These claims do not disclose literally, or substantively, a "light source having a plurality of light sources 230" as set forth by the Examiner.

The U.S. Court of Appeals for the Federal Circuit has held that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The court later added that "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Per the requirements of Section 2131 of the Manual of Examining Procedure, the Examiner has not shown that Yoganandan discloses an illuminator or an array of a plurality of light sources, as

required by claims 1 and 7. More specifically, the illuminator and the array elements are not shown. The Examiner has also omitted to state where the "light source" is found in the Yoganandan disclosure.

Claims 1, 2, 4-12 do not disclose "an FR4 substrate" as asserted the Examiner. Claim 3 discloses that its "electrically insulating body is of FR4 material. However, Applicants have heretofore submitted that the Examiner has not shown that Yoganandan meets the limitations of independent claim 1 upon which claim 3 depends. In addition, none of the rejected claims disclose "a pad 270 below the substrate made of copper" as set forth by the Examiner. The element of copper is nowhere to be found in these claims.

As the Federal Circuit explained in *Structural Rubber Products Co. v. Park Rubber Co.*, 749 F.2d 707, 716-17 (Fed. Cir. 1984), the absence from a cited reference of any limitation of a claim negates anticipation, even if the difference is "insubstantial" or "clearly obvious." As such, the Applicants assert that the rejection of independent claims 1 and 7, and dependent claims 2-6, 8-12, and 28-33 is improper. This rejection is respectfully traversed.

With regards to claims 18-21, the Examiner states that Yoganandan discloses "a light source having a heat sink..., [and] a circuit board material made of FR4 material." See Office Action, page 3, paragraph 2. The Examiner further states that "figure 17 shows a plural conductors [sic] 224 act as a reflective surface." Claim 18 of the pending application discloses "a method of producing an illuminator comprising the steps of: providing a substrate body of insulating material, completing a substrate by plating the body with an electrically conductive plating; forming an array of cavities in the substrate at a top side, the cavities having a shape for desired light reflections; and placing a light source in each cavity

In light of the foregoing arguments, withdrawal of the rejection of claims 1-12 and 28-33 under 35 U.S.C. § 102(e) as being anticipated by Yoganandan is respectfully requested.

**CLAIM REJECTIONS – 35 U.S.C. § 103(a)**

The Examiner rejected claims 13-17 and 22-23 under 35 U.S.C. § 103(a) as being unpatentable over Yoganandan as applied to claims 7 and 21 above, and further in view of U.S. Patent No. 6,045,240 to Hochstein (hereinafter referred to as “Hochstein”).

The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. *MPEP* §2142.

The Examiner asserts that Hochstein discloses “a LED lamp assembly with means to conduct heat away from the LED’s having a plural of light emitting diodes 28, heat sink 36, a cavity 54 and column 6, lines 6-34 teaches of a global thermally conducting layer underneath a cavity of the LED.” Office Action, page 4, paragraph 2. The Examiner further states that “it would have been obvious...to combine the light source of Yoganandan et al having a LED sources and heat sink with the LED lamp of Hochstein with conducting plating in order to provide a means of providing...heat conduction to a LED as taught by Hotchstein.” Office Action, page 4, paragraph 3. For support, the Examiner cites the abstract and column 3, lines 58-67 and column 4, lines 1-6. The Applicants respectfully traverse this rejection.

The Applicants hereby submit that one of ordinary skill in the art would not have combined Hochstein to provide the global thermally conductive layer missing in Yoganandan to provide “heat conduction to a LED” as set forth by the Examiner. *Id.* The purpose of the invention disclosed in Hochstein is set forth in the very title of the invention – “LED LAMP

**ASSEMBLY WITH MEANS TO CONDUCT HEAT AWAY FROM THE LED's".**

(Emphasis added). The invention sets out to solve the long felt need of *dissipating* heat away from the LED in order to increase the life cycle of a traffic signal LED. Indeed, the Hochstein disclosure states that "the key to improving the life of the L.E.D.s in traffic signal service is to reduce the temperature of the LED environment." Col. 2, lines 15-18. The disclosure further states that "many technically issues must be carefully considered in the design of reliable LED signals, but among the most important are the thermal properties of the various components that form the heat flow path." Col. 3., lin. 7-10. (Emphasis added). The Examiner has acknowledged that the purpose of the Hochstein invention was to provide "a LED lamp assembly with means to conduct heat away from the LED's." Office Action, page 4, paragraph 2. Yet the Examiner seeks to combine Yoganandan with Hochstein to create an invention that is inopposite to its very purpose, and which therefore makes it inoperable. The Examiner proposes the Hochstein provides the missing thermally conductive layer to provide "*heat conduction to a LED* as taught by Hochstein." Office Action, page 4, paragraph 3. (Emphasis added). Hochstein does not teach heat conduction to an LED, as it is designed to dissipate heat away from the LED in order to increase its useful life. Accordingly, one of ordinary skill in the art would not have combined Yoganandan with Hochstein to conduct heat to an LED as asserted by the Examiner.

Therefore, Applicants respectfully request that the rejection to these claims be removed.


**CONCLUSION**

In view of the foregoing remarks, Applicants respectfully request all the objections and rejections to the specification and claims be removed. If, for any reason, the Examiner disagrees, please call the undersigned attorney at 202-861-1797 in an effort to resolve any matter still outstanding before issuing another action. The undersigned attorney is confident that any issue which might remain can readily be worked out by telephone.

In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 50-2036 with reference to Attorney Docket No. 40019.21500.

Respectfully submitted,

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